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November 25, 1997

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

BY HAND DELIVERY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, N.W. Room 222
Washington, DC 20554

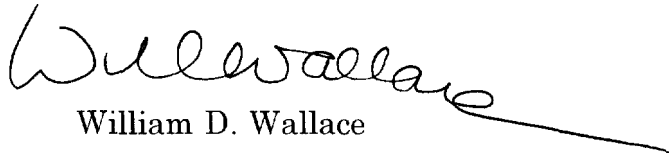
RE: WT Docket No. 97-217; File No. RM-9060

Dear Ms. Salas:

Transmitted herewith for filing with the Commission on behalf of the Catholic Television Network are an original and four copies of its Request for Supplemental Comment Period and Extension of Time in the above-referenced matter.

Should there be any questions regarding this matter, please communicate with this office.

Very truly yours,


William D. Wallace

Enclosures

Rec'd at C's rec'd 044
11/25/97

ORIGINAL

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Amendment of Parts 1, 21, and 74)
to Enable Multipoint Distribution)
Service and Instructional Television)
Fixed Service Licensees to Engage)
in Fixed Two-Way Transmissions)
_____)

MM Docket No. 97-217

File No. RM-9060

REQUEST FOR SUPPLEMENTAL
COMMENT PERIOD AND EXTENSION OF TIME

The Catholic Television Network (CTN), by its undersigned attorneys, is filing this preliminary statement regarding the Notice of Proposed Rulemaking (NPRM) in the above-referenced docket to request that the Commission supplement the comment period in order to give interested parties an opportunity to comment on a proposal not specifically included within the NPRM but clearly within the ambit of the issues raised therein. CTN is an association of 18 Roman Catholic Archdioceses and Dioceses throughout the United States which hold licenses in the Instructional Television Fixed Service (ITFS) for the distribution of instructional programming in diocesan schools and which lease excess capacity airtime to wireless cable operators. As an interested party, CTN filed comments and reply comments during the initial round of comments on the Petition for Rulemaking (RM-9060).

Since the Petition was filed, CTN has been reviewing the proposals therein with particular concern for the potential for harmful interference into existing

ITFS receive sites. It has also been concerned about the preclusive effect of a "cellularized" market on the growth and expansion of ITFS systems. Although the Commission modified some of the Petitioners' proposals, the rules proposed in the NPRM have not alleviated CTN's concerns regarding interference. Indeed, after careful study of the interference environment resulting from the rule modifications in the NPRM, CTN has concluded that the proposals threaten the continued viability of existing ITFS stations and the growth of ITFS systems as instructional resources. This conclusion raises serious concerns for CTN members because of their need for a viable technology for "distance learning," as discussed in CTN's Comments, filed May 14, 1997.

CTN has previously indicated that it generally supports the proposed use of ITFS and MDS spectrum for two-way transmissions. However, it now believes that a two-way system should be implemented only if sufficient frequency separation is provided between "downstream" and "upstream" transmissions, in part, for the reasons set forth in the attached "Joint Statement" of John F.X. Browne, Robert W. Denny, Jr., and Dane E. Ericksen. As indicated in the Joint Statement, the placement of multiple response transmitters within the service areas of non-co- and adjacent-channel ITFS stations is likely to create a potential for "brute force" interference which does not exist in the current architecture for ITFS and MDS stations. CTN's engineering consultants conclude:

One solution to this new brute force interference threat would be to require use of a guard band, so as to allow the practical use of either protective filters, downconverters with greater immunity to brute force overload, or a combination of both mitigation measures, where appropriate, to ensure that nonCOADJ receive sites do not suffer interference from Response Station transmitters.

Joint Statement, ¶ 5. Included in the Joint Statement is a proposal to "refarm"¹ the E-, F-, G- and H-Channel Groups to create a band of contiguous ITFS spectrum at 2500-2620 MHz and a band of contiguous spectrum dedicated for response transmissions at 2644-2690 MHz. The proposal in Figure 1 of the Joint Statement would make available up to 24 MHz of spectrum as a guard band between ITFS point-to-multipoint transmissions and any response transmissions.

The use of frequency separation, and, specifically, the use of refarming within the 2.5 GHz band, as a means to mitigate interference was not considered in the NPRM. Given the threat of brute-force interference from the existing proposals for two-way transmissions, CTN believes that interested parties should have an opportunity to comment on refarming as a solution to the potential for interference arising from two-way transmissions. Accordingly, CTN is providing below guidelines to implement the proposal in the Joint Statement. These guidelines would permit refarming of certain ITFS and MDS frequencies and thereby provide sufficient frequency separation between upstream and downstream transmissions to protect current and future uses of ITFS.

¹ The term "refarming" refers to a shifting of specific frequencies used by certain stations with no reduction in net available bandwidth to each class of station.

In order for this and other spectrum realignment proposals to be considered by all interested parties, CTN requests that the Commission issue a supplemental Public Notice in this docket and extend the dates for filing comments and reply comments, so that all parties have an opportunity to consider the concept of spectrum realignment in this docket.

Proposal²

A refarming plan for the ITFS/MDS spectrum to operate with two-way transmissions should ideally achieve several goals. First, upstream and downstream transmissions must be sufficiently separated so as to reduce the potential for harmful interference to each other. Second, the spectrum must be used as efficiently as possible for the benefit of existing and future users. Third, the spectrum reservation for ITFS must be preserved.

For example, guidelines such as the following for response transmissions in the 2.1 GHz and 2.5 GHz bands could be used to accomplish these goals, consistent with the proposal in the Joint Statement.

- I. 2.1 GHz Band. Commercial response stations may transmit on the following channels: MDS-1, MDS-2/2A.
- II. 125 kHz Response Channels. All 125 kHz response channels at 2686-2690 MHz are reallocated to ITFS, and may be used for ITFS response transmissions, but not for point-to-multipoint uses.

² This proposal is primarily used to illustrate the possibility of spectrum realignment. CTN reserves the right to propose modifications to this proposal or a different plan in subsequent comments.

III. 2644-2686 MHz. The G- and H-Channel Groups may be used for response transmissions as long as all point-to-multipoint operations have been cleared from this band.

A. Clearing point-to-multipoint ITFS operations could be accomplished by allowing the ITFS G-Channel licensee to (i) consent to its channels being used as response channels, (ii) request relocation of its channels, or (iii) enter into a shared-time agreement with another ITFS licensee on the A-, B-, C-, or D-Channel groups.

1. If the ITFS operator consents, then it could remain licensed on the G-Group channels used for response transmissions, as long as its ITFS programming obligations are satisfied on other channels within the wireless cable system.
2. If the ITFS licensee requests relocation, then the wireless cable operator should pay all expenses of relocation of the facilities.
3. If the ITFS licensee enters into a shared-time agreement, then the G-Channels could be used for response transmissions, and the licensee's programming obligations could be fulfilled on the channels of its ITFS partner.

B. The following channels could be designated for relocation of G-Channel stations:³

1. Any vacant ITFS frequency (A1-4, B1-4, C1-4, D1-4) in the market.
2. Any ITFS frequency in the market which is vacated by another licensee pursuant to negotiations with the wireless cable operator and/or the ITFS licensee.
3. MDS Channels E1-2, F1-2.

³ In many instances, arrangements may be necessary for use of the H-Channels for response transmissions, including refarming. However, since these channels have generally been used for commercial operations, CTN is focusing on refarming issues related to ITFS stations, which have programming obligations.

- IV. Use of E/F Channels Licensed to MDS. In order to relocate G-Channel facilities to E1-2, F1-2, the existing E-Channel licensee could be relocated to E3-4 and F3-4, and the existing F-Group licensee could be relocated to frequencies within the G-/H-Groups.
- V. Use of E/F Channels Licensed to ITFS. If either the E- or F-Channel Group is licensed to a grandfathered ITFS station, then E1-2 and F1-2 may not be available for refarming of G-Channels unless the wireless cable operator can also relocate the grandfathered E- and/or F-Channel licensees.
- VI. Other Alternatives. When an ITFS station on the G-Channel Group needs to be refarmed:
 - A. An ITFS licensee on the A-, B-, C-, or D-Channel groups may be willing to exchange one or more of its channels for one or more of the G-Channels with the understanding that the G-Channels will be dedicated for response transmissions.
 - B. In order to clear point-to-multipoint operations, it may be feasible to permit a G-Channel ITFS licensee to enter into an agreement to share time with an ITFS licensee on the A-, B-, C-, or D-Channel groups. In such arrangement, each operator could fulfill its ITFS programming obligations on the point-to-multipoint frequencies and use the G-Channels for response transmissions.
 - C. When accommodating channel relocations, exchanges, or shared-time agreements, Section 74.902(d)(1) (four channel rule) should not apply.

In order to illustrate how these guidelines could operate to permit refarming of the spectrum, CTN is providing several examples. In all of these examples, Gamma University is an ITFS licensee on the G-Channel Group. Wireless Corp. desires to use the G-Channels for response transmissions.

Example 1 (Consent): Gamma U. is willing to allow the G-Channels to be used for response transmissions and to have its ITFS programming obligations met on other channels within the wireless cable system. In this market, Wireless

Corp. is licensed on MDS-1 and MDS-2A, and leases time on H1-2-3; therefore, no further realignment of channels is necessary to permit up to 52 MHz of spectrum to be used for commercial response transmissions within the market. No refarming would be immediately necessary.⁴

Example 2 (Relocation Case A): Gamma U. requests relocation of its ITFS facilities. Wireless Corp. relocates G1-4 to vacant ITFS spectrum at B1-4. Gamma is licensed on Channels B1-4. Channels G1-4 are transferred to Wireless Corp.'s BTA license, or used to refarm the facilities on Channels E1-2, F1-2.⁵

Example 3 (Relocation Case B): Wireless Corp. is unable to relocate G1-4 to vacant ITFS spectrum. It holds the license for the E-Channels and another MDS licensee -- Cable Co. -- holds the license for the F-Channels. Wireless arranges a relocation of Channels G1-4 to E1-2, F1-2. Wireless Corp.'s station is refarmed to channels E3-4, F3-4. In exchange for F1-4, Cable Co. is licensed for G1-4.⁶ See Figure 1 of Joint Statement (attached).

Example 4 (Channel Exchange): In order to accommodate Gamma U., Alpha College, licensee of the A-Channels, requests an exchange with Gamma, subject to G1-4 being operated for response transmissions by Wireless Corp. Alpha College (A1-4) and Gamma U. (G1-4) exchange channel groups. G1-4 are

⁴ Channels E1-2 and F1-2 may be kept available for future refarming, if needed, to preserve a total of 120 MHz for ITFS in the market.

⁵ Channels E1-2 and F1-2 may be kept available for future ITFS use to preserve a total of 120 MHz for ITFS in the market.

⁶ Other "refarming" plans may be available depending upon the desires of the E- and F-Channel Group licensees.

used for response transmissions, and Alpha's ITFS programming obligations are fulfilled within the wireless system.

Example 5 (Channel Sharing): Gamma U. enters into an agreement with Alpha College for each licensee to program time on the other's channels, up to the limits of their respective excess capacity lease agreements, if any. Gamma U. and Alpha College meet their respective ITFS programming obligations through a combination of video programming and data transmissions on the A- and G-Channel groups.

Conclusion

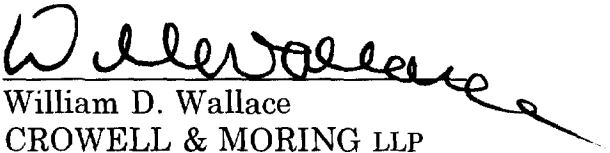
CTN submits that a set of rules which permit refarming of spectrum, in a manner similar to that described above, would serve the public interest by allowing ITFS and MDS licensees to use their spectrum resources efficiently for two-way services. Moreover, by placing response transmissions for data services in a designated block of spectrum, the proposal would also provide greater interference protection for ITFS receive sites.

CTN recommends that the Commission consider this and other refarming proposals, as well as issues related to refarming, in this docket. To that end, CTN

requests that the Commission issue a supplemental Public Notice requesting comments on such a proposal and extend the date for filing comments and reply comments on all proposals in this docket by at least 30 days.

Respectfully submitted,

CATHOLIC TELEVISION NETWORK

By: 

William D. Wallace
CROWELL & MORING LLP
1001 Pennsylvania Avenue, N.W.
Washington, DC 20004
(202) 624-2500

Its Attorneys

November 25, 1997

1444738

Catholic Television Network

**Joint Engineering Exhibit
in Support of Request for
Supplemental Comment Period
and Extension of Time**

MM Docket No. 97-217

November 24, 1997

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Catholic Television Network

Joint Statement of John F.X. Browne, P.E., Robert W. Denny, Jr., P.E. and Dane E. Ericksen, P.E.

The firms of John F.X. Browne and Associates, Denny & Associates, and Hammett & Edison, Inc., have been jointly retained on behalf of the Catholic Television Network ("CTN"), representing numerous Instructional Television Fixed Service ("ITFS") stations licensed to, and operated by, the Roman Catholic Church throughout the United States, to summarize a CTN position with regard to MM Docket 97-217 concerning two-way, "cellularized" wireless cable stations.

NPRM Fails to Address Brute Force Overload Issue

1. On October 10, 1997, the Commission released the above-captioned Notice of Proposed Rulemaking ("NPRM"). One issue not addressed in the NPRM was that of brute force overload* to broadband downconverters typically used at fixed ITFS receive sites; or, in other words, the issue of protecting non-co-channel and non-adjacent-channel ("nonCOADJ") ITFS receive sites from nearby Response Station transmitters with main-beam equivalent isotropic radiated powers ("EIRP") of up to +48 dBm (63 Watts).
2. While technical data on the brute force overload levels from conventional National Television System Committee ("NTSC") signals is available from downconverter manufacturers, there is a lack of similar data on the combined downconverter input power level allowable when the signals are a mix of NTSC and digital. Since Response Station transmitters would undoubtedly only use digital modulation, research on the input levels at which signals would cause brute force overload in the front ends of existing and commonly used downconverters is needed.
3. However, it is nevertheless possible to provide an illustrative example of the brute force interference threat. For the California Amplifier Model 130001 32 dB gain, 31-channel downconverter, the maximum input level is specified as -21 dBm for a single NTSC channel, or as -50 dBm for 31 NTSC channels (representing a combined power level of -35 dBm, or 15 dB less input power than for the single-channel case). A reasonable estimate would be to therefore assume a maximum input level value approximately halfway between these two cases, or -28 dBm, as the maximum input level for a combination of NTSC and digital signals. Now further assume a Response Station transmitter with an EIRP of +48 dBm and utilizing 6 MHz of Response Station

* "Brute force overload" refers to a condition where the first active device of a receiving system has so much combined radio frequency energy present that the active device (typically a transistor or integrated circuit) operates in a non-linear fashion. This can cause receiver de-sensitization, the generation of undesired distortion products, or both.



Catholic Television Network

spectrum. Finally, assume that the Response Station transmitting antenna is aimed directly at the ITFS receiving antenna, in which case the received carrier level ("RCL") of the undesired Response Station signal would be +48 dBm EIRP -64 dB free space path loss ("FSPL") + 20 dBi receive dish gain, or +4 dBm: that is, more than 30 dB above the assumed maximum input level. It is clear that this would cause brute force overload, in turn causing interference to nonCOADJ ITFS channels. No assumption of cross polarization between Response Station transmitters and ITFS receive sites should be made because it would require the entire universe of all ITFS stations in a given area to have the same polarization, an unlikely occurrence.

4. Because Response Station transmitters would be located throughout the service areas of other ITFS stations, the possibility, indeed, the likelihood, exists that one or more Response Station transmitters would be located in close proximity to an existing ITFS receive site that is neither co-channel nor adjacent-channel to the frequency being used by the Response Station transmitter. It can also reasonably be assumed that in some cases the main beam of the Response Station's transmitting antenna will be aimed directly at the nonCOADJ receiving antenna, either because the nonCOADJ ITFS receiving antenna has the misfortune to be directly in line with the path to the Response Station's hub receive site, or because the Response Station's transmitting antenna is mis-oriented, but not so badly mis-oriented that the non-technical subscriber loses service and therefore triggers a service call that would presumably correct the mis-orientation.

5. Therefore, it is clear that allowing a large number of Response Station transmitters to be intermingled among existing ITFS receive sites would create an entirely new brute force interference threat that did not exist under conventional ITFS and MDS architectures, where transmitters and receivers are generally not intermingled. One solution to this new brute force interference threat would be to require the use of a guard band, so as to allow the practical use of either protective filters, downconverters with greater immunity to brute force overload, or a combination of both mitigation measures, where appropriate, to ensure that nonCOADJ receive sites do not suffer interference from Response Station transmitters. It should be noted that, because the interference threat is brute force overload to the input stage of ITFS downconverters, post-downconversion filtering is not a solution.

6. This, in turn, would require a "partial-refarming" of ITFS/MDS spectrum. By "partial-refarming" it is meant a shifting of specific frequencies used by such stations, but with no reduction in net available bandwidth to each class of station. Because the vast majority of modern-day "wireless cable" transmitters are frequency synthesized, and because virtually all "master plan" antennas are broadband antennas covering the entire 2,500-2,686 wireless cable band, a shifting of frequencies should not represent a hardship.



Catholic Television Network

7. A possible guardband-based solution to the brute force overload threat is shown by the attached Figure 1. Under this approach, 120 MHz of ITFS bandwidth, and 66 MHz of MDS bandwidth, would continue to be available. However, only conventional “downstream” transmissions would be allowed between 2,500 and 2,644 MHz. Also, the G-Group ITFS channels would be shifted, or partially-refarmed, so as to be included in the 2,500–2,620 MHz now contiguous ITFS block. The MDS E-Group channels would be shifted to 2,620–2,644 MHz, and the MDS F Group channels, and MDS Channels H1, H2 and H3, would be shifted to 2,644–2,686 MHz. The spectrum from 2,686.00 MHz through 2,689.875 MHz would continue to be available only to ITFS stations for talkback channels; that is, this spectrum would continue to be comprised of twenty-eight 125-kHz wide talkback channels. The salient feature of this partially-refarmed band plan is that it places a 24-MHz guardband between downstream ITFS and upstream MDS operation, in which only downstream MDS operations are permitted.

8. There would be multiple advantages to such a partially-refarmed ITFS/MDS spectrum:

8a. It would eliminate the need for Response Station interference studies to other ITFS stations (but not to other MDS stations) because, at least for ITFS, there would no longer be Response Station frequencies that would be co-channel or adjacent-channel to ITFS operations. Thus, the entire issue of the exceedingly complex interference calculation methodology proposed in the NPRM, and the assumption of population density as a surrogate for the density and statistical location of Response Station transmitters, does not need to be addressed as far as ITFS licensees would be concerned.

8b. A 24-MHz wide guardband should provide sufficient transition bandwidth to allow practical bandpass or bandreject filters to be added prior to the first active device of ITFS downconverters; in concert with improved downconverters having better immunity to overload, this should ensure that brute force overload from Response Station transmitters to ITFS receivers would not occur. A guardband of less than 24 MHz may also be feasible.

8c. It would shift the brute force interference risk, and the threat of conventional co-channel and adjacent-channel interference, to spectrum occupied by wireless cable operators. Such entities should then be free to use whatever interference-calculating methodologies they, and the FCC, agree upon. In other words, any interference caused would be self-interference, thus providing a far more efficient incentive for interference-free operation than any regulatory review by Commission staff could ever provide.

Catholic Television Network

Summary

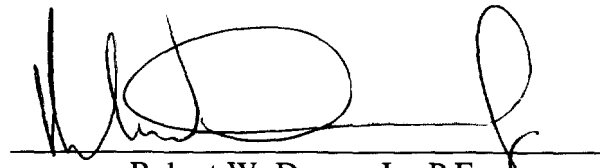
9. If Response Station transmitters are allowed to be intermingled within the ITFS service areas of non-co-channel/non-adjacent channel ITFS stations, it will be necessary for such stations to also consider the brute force overload interference they will cause to this greater universe of ITFS receive sites. A partially-refarmed ITFS/MDS spectrum, with a guardband where only conventional downstream MDS transmissions would be allowed, would still provide up to 54 MHz of bandwidth for Response Station transmissions, would allow the practical use of protective bandpass or bandreject filters to protect the front ends of ITFS downconverters, and would place the primary interference risk on spectrum used by the two-way wireless cable provider.

List of Figures

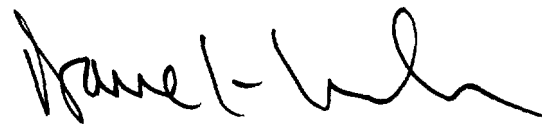
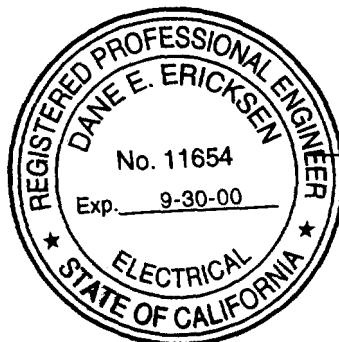
10. The following figure has been jointly prepared as a part of these MM Docket 97-217 comments:

1. Figure showing a possible partially refarmed ITFS spectrum.

John F.X. Browne, P.E.
John F.X. Browne and Associates, PC
Consulting Engineers



Robert W. Denny, Jr., P.E.
Denny & Associates, PC
Consulting Engineers



Dane E. Ericksen, P.E.
Hammett & Edison, Inc.
Consulting Engineers

November 24, 1997



HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

Catholic Television Network

Summary

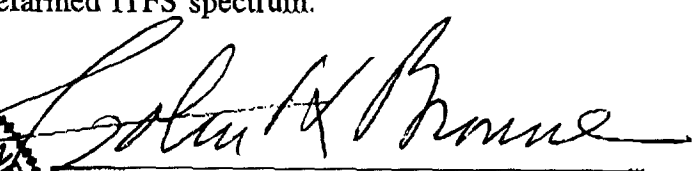
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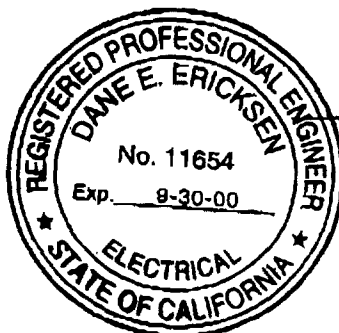
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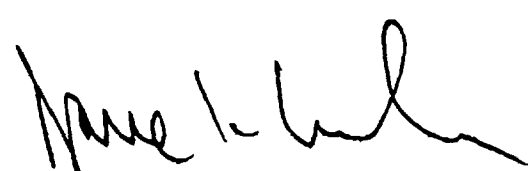
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John F.X. Browne, P.E.
John F.X. Browne and Associates, PC
Consulting Engineers


Robert W. Denny, Jr., P.E.
Denny & Associates, PC
Consulting Engineers



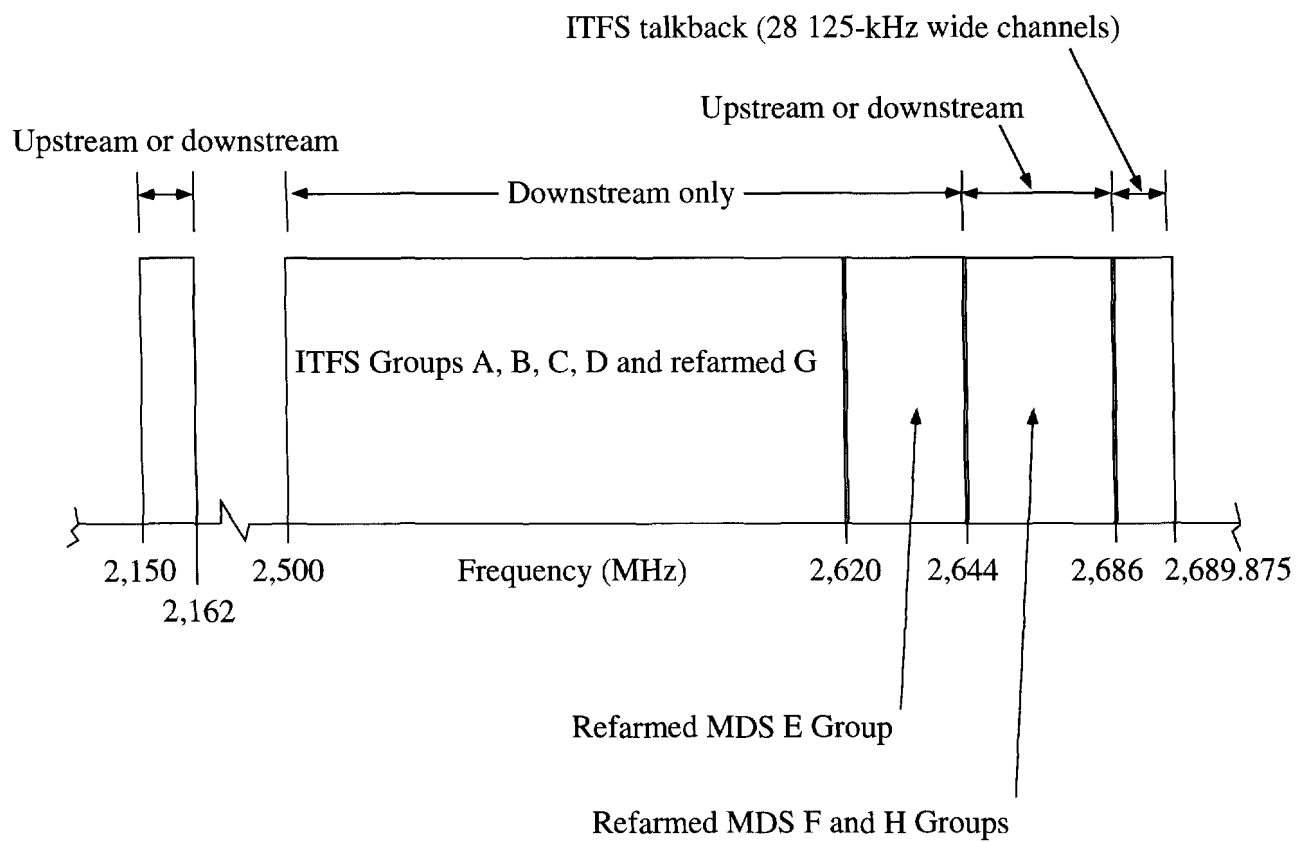

Dane E. Ericksen, P.E.
Hammett & Edison, Inc.
Consulting Engineers

November 24, 1997



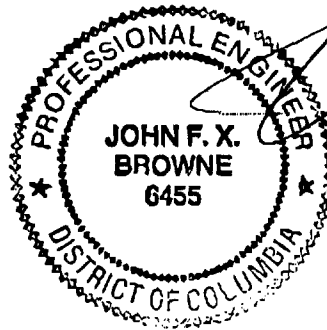
HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

Catholic Television Network, Inc.
Possible Partially Refarmed ITFS Spectrum



Certification

I hereby certify that the attached engineering statement was jointly prepared by the listed affiants, Robert W. Denny, P.E. and Dane E. Erickson, P.E. and me. It is further stated that all statements of fact contained therein are true of my own personal knowledge or are believed to be true and correct if based on information from others.



John F. X. Browne
John F.X. Browne, P.E.
November 25, 1997

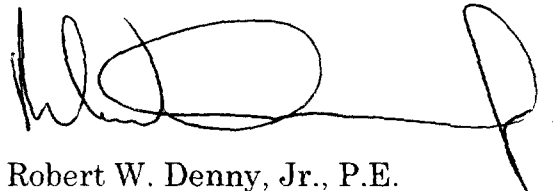
DENNY & ASSOCIATES, P.C.
CONSULTING ENGINEERS
WASHINGTON, DC

JOINT ENGINEERING EXHIBIT
IN SUPPORT OF REQUEST FOR
SUPPLEMENTAL COMMENT PERIOD
AND EXTENSION OF TIME
MASS MEDIA DOCKET NUMBER 97-217
CATHOLIC TELEVISION NETWORK

Affidavit

WASHINGTON)
) ss:
DISTRICT OF COLUMBIA)

Robert W. Denny, Jr., being first duly sworn, says that he is president and treasurer of the firm of Denny & Associates, P.C., consulting engineers with offices in Washington, DC; that he is a professional engineer registered in the District of Columbia, the State of Maryland, and other jurisdictions; that his qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission; that the foregoing exhibit was prepared by him or under his direction; and that the statements contained therein are true of his own personal knowledge except those stated to be on information and belief and, as to those statements, he verily believes them to be true and correct.



Robert W. Denny, Jr., P.E.

Subscribed and sworn to before me this 24th day of November, 1997.



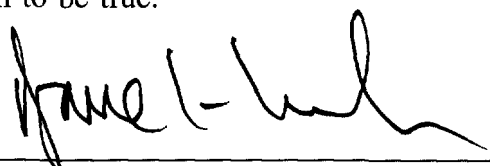
Jennifer J. Mateik
Notary Public, District of Columbia
My commission expires June 30, 2001

Affidavit

State of California |
County of Sonoma | ss:

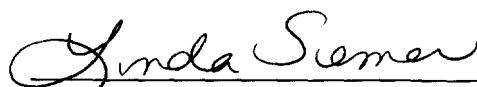
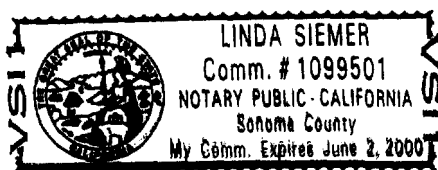
Dane E. Ericksen, being first duly sworn upon oath, deposes and says:

1. That he is a qualified Registered Professional Engineer, holds California Registration No. E-11654, which expires on September 30, 2000, and is employed by the firm of Hammett & Edison, Inc., Consulting Engineers, with offices located near the city of San Francisco, California,
2. That he graduated from California State University, Chico, in 1970, with a Bachelor of Science Degree in Electrical Engineering, was an employee of the Field Operations Bureau of the Federal Communications Commission from 1970 to 1982, with specialization in the areas of FM and television broadcast stations and cable television systems, and has been associated with the firm of Hammett & Edison, Inc., since October 1982,
3. That the firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of the Catholic Television Network ("CTN"), representing numerous Instructional Television Fixed Service ("ITFS") stations licensed to, and operated by, the Roman Catholic Church throughout the United States, to summarize a CTN position with regard to MM Docket 97-217 concerning two-way, "cellularized" wireless cable stations,
4. That such engineering work has been carried out by him or under his direction and that the results thereof are attached hereto and form a part of this affidavit, and
5. That the foregoing statement and the report regarding the aforementioned engineering work are true and correct of his own knowledge except such statements made therein on information and belief and, as to such statements, he believes them to be true.



Dane E. Ericksen, P.E.

Subscribed and sworn to before me this 24th day of November, 1997



HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

CERTIFICATE OF SERVICE

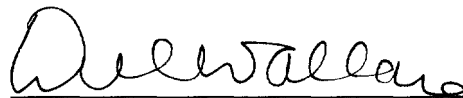
I, William D. Wallace, hereby certify that I have on this 25th day of November, 1997, caused to be served true and correct copies of the foregoing "Request for Supplemental Comment Period and Extension of Time" upon the following parties via hand delivery (indicated by an *) or first-class United States mail, postage prepaid:

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